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CHARLES BULLOCK, PH.M.[1]

For the first time in the history of the Philadelphia College of Pharmacy are we called upon to record the decease of the President during his tenure of office.

Charles Bullock was a direct lineal descendant of John Bullock, a member of the Society of Friends, who emigrated from England in the very early part of the eighteenth century. His wife died on board the ship during the passage.

His second wife was Mrs. Susannah Parrott, whose maiden name had been Susannah Wright. The Wrights had acquired title to large tracts of land in New Jersey by purchase and deeds from the Indians.

The records show that in 1724 Elizabeth Parrott deeded to John and Susannah Bullock 200 acres in the township of New Hanover, Burlington County, N. J. He settled thereon and engaged in farming. Several hundred acres more were acquired by subsequent purchases. A large portion of this estate still remains in the possession of direct descendants.

For three generations the family continued in this peaceful occupation, happy in their unrestricted religious liberty and enjoying the most friendly relations with their fellow-beings.

On this old homestead, near Arneytown, N. J., John Bullock, the father of Charles Bullock, was born on January 14, 1785. He was wont to relate anecdotes of these early days and experiences, and as indicating the peaceful conditions of the surroundings, related that

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the doors were not barred at night, and that it was no unusual thing for him, in his boyhood days, on coming downstairs in the early morning, to stumble over the prostrate forms of some of their Indian neighbors slumbering around the kitchen fire. He was a scholarly gentleman, and was married in 1821 to Rachel Griscom, the sister of Prof. John Griscom. He became principal of a select school for boys at Wilmington, Del. While apparently not established by the Society, yet from the devout character of the principal and associations it became known as a Friends' school, and received encouragement and support from many families of that faith.

It enjoyed an excellent reputation, and attracted many students from a distance and was particularly well patronized by students from the West Indies and South America.

To this couple was born in Wilmington, on February 25, 1826, a son, Charles Bullock, the subject of this memoir. He and an elder brother, Dr. Wm. R. Bullock, were the only ones of five children to reach maturity.

His early education was obtained at the school established by the monthly meeting of the Society of Friends, and afterwards he attended the school conducted by his father.

His uncle, Prof. John Griscom, was an enthusiastic and progressive teacher of chemistry. He is said to have possessed remarkable conversational ability, and was noted for his successful experiments in illustration of his lectures on chemistry. He spared no effort to obtain materials and apparatus, even importing these when necessary. On his visits to Wilmington, many of these lectures and experiments were repeated. In addition to his scholastic attainments, Charles' father possessed considerable mechanical skill and ingenuity, which he loved to apply to the construction of apparatus to illustrate the tuition of the school.

The visits of his uncle were greatly enjoyed by Charles, and with boyish enthusiasm he entered upon the study of chemistry and natural philosophy, electrical phenomena claiming special attention. His father's cabinet of apparatus, designed to illustrate the teaching of physics in the school, was at his command, and with a workshop fitted up with a lathe and the necessary tools at his disposal, he devoted most of his leisure time to improvising apparatus for his experiments.

These associations of his youth, undoubtedly, directed the trend

of his mind toward scientific study and experimentation, which was so pronounced throughout his entire career and determined his selection of pharmacy as a life calling because of its practical application of the sciences to which he was devoted.

At the age of 15, Charles was sent to Haverford College, then a school under the direction of the Society of Friends. It appears that he did not complete the course of instruction here. The decease of his mother at this time was probably the cause of his leaving college.

On May 1, 1844, he commenced his apprenticeship of four years with Messrs. Smith & Hodgson. He enjoyed the training of these excellent pharmacists, and in after years frequently referred to the carefulness, neatness and skilful manipulations of Mr. Hodgson in dispensing. With a determination to master thoroughly the duties of his position and the intricate knowledge of the business, he applied himself diligently, and with a mind trained to scientific study and possessing great natural ability, he profited exceedingly by his opportunities.

Entering the Philadelphia College of Pharmacy, he was graduated in the Class of 1847. His inaugural thesis was upon Kalmia latifolia, which, at that time, had attracted some attention among the medical practitioners. This paper was a carefully prepared and creditable work, and indicated his acquaintance with the methods of plant analysis then in vogue. It was published in the AMERICAN JOURNAL OF PHARMACY, 1848, page 360.

He continued in the employ of his preceptors until, in company with his friend, Edmund A. Crenshaw, they succeeded to the business.

This old and, at that time, well-known drug firm, Smith & Hodgson, deserves more than a passing comment. In 1819 Daniel B. Smith established his drug store at the northeast corner of Arch and Sixth Streets. At that time this was one of the most secluded and quiet localities in the city, and was largely occupied by the comfortable houses of the prominent members of the Society of Friends. The proprietor was noted for his scientific knowledge, literary attainments and practical philanthropy. His large acquaintance, natural ability and exemplary character enabled him to exert a great influence, which was largely applied in the directions of the advancement of scientific education and the establishment of

charitable institutions tending toward the improvement of the social and moral conditions of the needy.

At the first meeting of the Philadelphia College of Apothecaries, in 1821, he was elected Secretary, and continued as Secretary of the College for seven years. As chairman of the Publication Committee, Daniel B. Smith issued the first number of the AMERICAN JOURNAL OF PHARMACY, and contributed the initial original paper.

For a quarter of a century he served as President of the College, ever keeping acquainted with the growing needs of pharmaceutical education, and ever ready to counsel and give encouragement to the efforts of others.

In 1828, Wm. Hodgson, Jr., who had studied chemistry in England, and learned the drug business at the celebrated apothecary of John Bell & Co., Oxford Street, London, became associated in the business, and, for twenty years, the firm of Smith & Hodgson continued to do a thriving business. For years this was the only house in Philadelphia dealing in chemicals and apparatus. This portion of their business developed greatly, and their laboratory facilities here were inadequate. Desiring to engage more extensively in the manufacture of chemicals, in 1848 they built a laboratory on Gray's Ferry Road.

A number of the young men who entered the employ of Smith & Hodgson subsequently became prominent in chemical industries and influential in pharmacy. Among these may be mentioned Thomas Powers, Henry Pemberton, Charles Bullock and Wm. J. Jenks.

It is not surprising that Charles Bullock, at this period of his life, when character is moulded and business training is inculcated, should, probably unconsciously, absorb the impressions and many of the characteristics of his preceptors.

Smith & Hodgson, desiring to devote their attention to the development of their laboratory, decided to dispose of their drug business. Charles Bullock and Edmund A. Crenshaw, two of their employees, formed a copartnership, and, on January 1, 1849, Bullock & Crenshaw succeeded to the business. While Mr. Crenshaw devoted the major portion of his time to the development of the wholesale drug business, Mr. Bullock assumed charge of the department of chemicals and apparatus, and also the manufacture of pharmaceuticals and pure chemicals.

The decade immediately following their engagement in business was marked by an era of remarkable advance in the manufacturing and mining industries of the country. The practical application of chemistry in these industries also greatly stimulated study and research, and these young merchants found the supplying of chemicals and apparatus for laboratory and lecture purposes a profitable portion of their business.

During this decade, the wholesale drug department was also making rapid strides. Philadelphia, as the centre of medical education, attracted many students. As a large proportion of these came from country districts where drug stores were not convenient, it became quite a custom for the young physician before leaving Philadelphia to provide himself with an outfit of drugs. Bullock & Crenshaw published sets of labels and a price-list of outfits for office practice, medicine cases and the old-fashioned saddle-bag medicine cases at that time so much used by the country practitioners.

They enjoyed quite a large trade in this line, especially among physicians in the Southern States. The Civil War destroyed the credit of many of these Southern families, and as a result the firm sustained a serious financial loss.

In the summer of 1851 Charles Bullock made a trip to Europe, sailing from Philadelphia on one of the Cope Line clipper ships. He visited and studied the World's Fair, then in progress in London, noting with interest all relating to advancements in the arts and sciences. After a tour through Great Britain and Ireland, he travelled on the Continent, visiting all the important cities. On this trip he acquired valuable information regarding the customs, methods of business and manufacture, and established commercial relations for his firm with many of the prominent manufacturers of philosophical apparatus and chemicals for technical and laboratory work. He returned to New York on one of the Collins Line steamships, the "Humboldt," in the autumn of 1851.

Bullock & Crenshaw were the first manufacturers in Philadelphia of sugar-coated pills, and for years did an extensive business in these. On the introduction of fluid extracts, they engaged in their manufacture, and in each one decided by experimentation upon the proper method and correct menstruum to be used. Their line of pharmaceutical products included also extracts, syrups, elixirs and tablets.

For some years they owned and manufactured Osborn's water colors, which were said to be fully equal to any of foreign manufacture.

The growth of their business necessitated more room, and through the interest of Thos. Powers the property now known as 528 Arch Street, previously occupied by the S. S. White Dental Manufacturing Company, was secured, and also the property in the rear, 531 North Street.

A four-story brick connecting building was constructed and the entire property remodelled and refitted, and in September, 1868, they removed to this location, where they have since continued.

A retail apothecary and dispensing department has always been maintained. Following the old custom of the trade, the firm has employed and given practical instruction to a great many apprentices, and has always encouraged these to take advantage of the scientific education offered by the College. It is doubtful if any other firm has been preceptor to so large a number of the students of the Philadelphia College of Pharmacy.

For more than fifty years this firm has continued in business, and the principles of honest, conscientious discharge of every duty pertaining to their calling, either as dispensing pharmacists, manufacturers or merchants, were grafted so thoroughly and impressively upon all their dealings that they established an exemplary business reputation.

Always careful in the selection of quality in their purchases, using the purest materials only, and insisting upon maintaining the most exacting requirements of the methods of preparation and dispensing, their products enjoyed the confidence of both physician and pharmacist.

Charles Bullock was an educated pharmacist of the old school, who realized the importance of his calling, and aimed to be an honor thereto. He was not devoid of ambition, and while he strove for financial success, nevertheless the mere acquirement of wealth had but a secondary place in his efforts, and in this direction his friends and business associates thought him entirely too conservative. He especially deprecated the introduction of patent medicines and proprietary remedies into pharmacy. Their rapid increase in number only increased his distaste for this class of preparations. This feeling finally became so pronounced that some years ago he decided to eliminate them entirely from their jobbing business.

In 1849, Charles Bullock became a member of the Philadelphia College of Pharmacy, and shortly thereafter was elected a Trustee. On September 24, 1864, he was elected Recording Secretary of the College, to succeed Edward Parrish, who had just been elected to the chair of Materia Medica made vacant by the decease of Dr. R. P. Thomas. He discharged the duties of Secretary with marked ability until March 31, 1873, when, in a letter to his associates, he asked to be relieved. On March 30, 1874, he was elected First Vice-President, and on March 30, 1885, was chosen as President, to succeed Dillwyn Parrish, who resigned on account of advancing years.

At the annual meeting of the College in 1898, upon accepting the re-election as President, he feelingly referred to his love for and interest in the success of his *Alma Mater*, but impressed upon his fellow-members that he desired to be relieved at the expiration of the year's service, as he felt that age was telling upon him and that his energy was no longer equal to the responsibilities placed upon him. At the next annual meeting he reiterated his determination to retire, but a number of his friends persuaded him to permit the use of his name for another year.

From his inception into the drug business, Charles Bullock has always lived in an atmosphere permeated by the influence of the Philadelphia College of Pharmacy. For half a century was he connected with the institution, and served her faithfully both as a member and an officer. His interest and zeal in her success were unwavering and untiring was his work in her behalf. She claimed a larger share of his time than any other interest outside of his business. He was a member of the committee that selected the present site of the College, and has served on all her building committees since. For years he was chairman of the Property Committee and the Committee on Instruction, and Treasurer of the Publication Committee, and has been a member of nearly every important committee of the College or the Board of Trustees.

As a member of the Committee on Memoirs he has prepared many of the biographies of deceased members, and in these he has exhibited most excellent taste and a pleasing and appropriate literary style. The memoirs of Prof. Wm. Procter, Jr., AMERICAN JOURNAL OF PHARMACY, 1874, page 512, and Daniel B. Smith, AMERICAN JOURNAL OF PHARMACY, 1883, page 337, are models worthy of repeated perusal and study.

A brief retrospection will serve to show the value of his services to pharmacy. He enjoyed the confidence of the older members who were instrumental in establishing the College. He was the cotemporary of Parrish, Procter and Maisch, and, bound by ties of close friendship, these eminent pharmacists were frequently associated in the study, scientific labors and literary productions that have added such lustre to American pharmacy and renown and honor to this College. He always assumed his full share of the responsibilities and labor. His efforts, though made in his usual quiet and unobtrusive manner, were always directed toward maintaining the highest standing for the College and upholding the dignity and scientific standard of her publications.

It was his privilege, as President, to safely guide the good old ship on several of her most successful and progressive voyages. His contributions to pharmaceutical literature, exclusive of reports and memoirs, number more than twenty-five papers published in the AMERICAN JOURNAL OF PHARMACY. His painstaking investigations of the complex principles existing in Veratrum viride were especially valuable and received prominent notice in foreign scientific publications, and he was elected an honorary member of several European societies.

In recognition of his public services for the advancement of pharmacy, his *Alma Mater* conferred upon him the degree of Master in Pharmacy, *honoris causa.* He was thoroughly acquainted with the various processes adopted by pharmacists and chemists, and was himself a skilled manipulator. He prided himself upon his ability to spread plasters by hand, and considered this attainment one of the lost arts of pharmacy.

Although largely self-taught in analytical chemistry, yet by study and practice he became accurate in his results. He was well acquainted with the methods of detecting impurities and adulterations, and had at his command the methods of purifying and making pure chemicals. He had especially worked out a scheme for separating the metals of the platinum group and producing pure salts of these; likewise, the production of pure salts of manganese. He possessed considerable mechanical skill and ingenuity in metal work and had fitted up at his home a small machine shop, replete with lathe, turning tools and all necessary accessories, and until a very short time before his decease took great pleasure in this work.

In 1857 Charles Bullock joined the American Pharmaceutical Association. He was elected Recording Secretary of the Association in 1859 and served in this capacity for two years. At the meeting in Philadelphia, in 1876, he was elected President. For a number of years he attended the annual meetings, and was greatly interested in the proceedings.

He was a member of the American Philosophical Society, but does not appear to have been active in its work.

He was also a member of the Academy of Natural Sciences of Philadelphia, and for a while he took an active interest in its Microscopical Section. Here he enjoyed the society and friendship of Dr. J. G. Hunt and Joseph Zentmayer. These kindred spirits made the section meetings profitable and interesting. Here Mr. Bullock's manipulative dexterity was again exhibited as he became expert in mounting and preparing permanent slides for microscopic examination.

For many years he was a member of the local Civil Service Board, charged with the duty of examining candidates for positions as chemists and pharmacists coming under the control of the municipal departments.

Next to the Philadelphia College of Pharmacy, the Franklin Institute claimed the attention and time of Charles Bullock. The wide scope of the work of the Institute, embracing science, arts, mechanics and manufacture, appealed strongly to his nature and in this field his varied experience and great breadth of knowledge made him a valuable worker and prominent in the direction of its affairs. He rendered valuable service as curator, manager, Vice-President and President and at the time of his decease was First Vice-President and a member of the Board of Managers. For years he served on the Publication Committee of the Institute and many of its other important committees. In 1874, the Franklin Institute gave an exposition in the old freight station at Broad and Market Streets, which had been but shortly before vacated by the Pennsylvania Railroad, and which subsequently became the property of John Wanamaker and was rebuilt for his store. As a precursor of the Centennial, it did much to prepare the way for and popularize the great exposition of 1876. Charles Bullock did excellent service on the committee of the Institute having charge of the exhibition.

In 1884, the Franklin Institute gave the "Electrical Exhibition" designed to illustrate the great advance that had been made in the practical applications of electricity, and again we find Charles Bullock serving as Chairman of the Committee on Space and Installation of Exhibits, a position in which he exhibited great administrative and executive abilities.

At a special meeting of the Board of Managers of the Franklin Institute, held Friday, March 23, 1900, the following resolutions were unanimously adopted:

"*Resolved*, That the Board has heard with extreme regret of the death of Mr. Charles Bullock, one of the oldest members of the Institute; one whose great ability in his profession, capacity for administration and mature judgment have been of the greatest service; while his uniform kindness and courtesy have endeared him to his associates on the Board.

"*Resolved*, That a committee of three be appointed by the President to prepare a memorial of Mr. Bullock for publication in the *Journal*.

"*Resolved*, That as a further testimony of respect for his memory, the members of the Board will attend the funeral in a body, and that the Institute be closed during the hours of service."

Charles Bullock was a keen observer and possessed the ability of storing away his observations for future application. This characteristic of a mind trained by scientific study is thus described by Sir John Lubbock:

"It would be impossible to overrate the importance of scientific training on the wise conduct of life.

"Science, said the Royal Commission of 1861, quickens and cultivates directly the faculty of observation, which in very many persons lies almost dormant through life, the power of accurate and rapid generalization, and the mental habit of method and arrangement."

His extensive reading and experience gave him a fund of knowledge covering a wide range of subjects relating to the arts and manufactures. He was frequently consulted by manufacturers seeking assistance to overcome chemical problems or difficulties arising in their work. He always was ready to respond, and most valuable information and suggestions were given gratuitously. In the investigations of accidents, explosions, fires or other calamities the

public officials and insurance inspectors frequently sought his assistance.

This disposition to impart information and to encourage others to acquire knowledge was one of his marked characteristics. He was a successful experimenter and capable of giving instructive exhibitions. In connection with his brother, Dr. Wm. R. Bullock, he delivered a series of lectures in Wilmington and nearby towns upon electrical subjects. They procured from Ritchie a large induction coil, the largest one then in this section of the country, and their demonstrations therewith attracted considerable attention. They also, by means of a powerful Maymoth battery, showed the deflagration of iron and the electric arc between carbon points, which they were forced to make themselves, as at that time none were to be had. On several occasions he gave instructive lectures on technical matters and illustrated by experiments to the young people of St. Peter's Church, Germantown.

He was a friend of Samuel Jackson, the noted pyrotechnist, and associated with him in many experiments. Taking considerable interest in pyrotechny, during the period of the Civil War, when these displays were popular, he made several very creditable amateur exhibitions with products of his own manufacture.

Charles Bullock was married on February 23, 1854, to Miss Margaret C. Robinson, of Richmond, Va. Mrs. Bullock died July 17, 1870. But one son, Wm. A. Bullock, a graduate of the Philadelphia College, survives.

Originally a member of the Society of Friends, he retained much of the quiet demeanor and simplicity so characteristic of the members of that faith. His marriage appears to have decided his connection with the Episcopal church, and shortly thereafter we find him a vestryman in old Christ Church and the teacher of a bible class in the Sabbath School. Upon removing to Germantown he united with Christ Church, Germantown. Owing to a variance of opinion of the pastor from that held by certain of his parish, some feeling arose, and it was decided by the pastor and his friends withdrawing and organizing the new parish of St. Peter's Church, Germantown, in 1873. Mr. Bullock and Mr. Crenshaw were both members of the vestry at the organization and by the death of the former the last remaining member of the original vestry has been removed to the Church Triumphant.

In 1897, the history of St. Peter's Church, Germantown, in the city of Philadelphia, by Rev. Theodore S. Rumney, D.D., and Charles Bullock, was published. The style of this historical sketch indicates very largely the pen of Charles Bullock.

His kindly disposition, his cheering words of comfort and advice, the personal sacrifices, the unpublished charities, the faithfulness with which every duty was performed, and, above all, the silent eloquence of a life diligently spent in the service of the Master, symbolize the thought, though unexpressed by him,

"Thy presence through my journey shine,
and crown my journey's end."

During the greater portion of his life Charles Bullock had enjoyed exceptionally good health. In recent years he had complained of neuralgia and rheumatism. The decease of his associate in business, Mr. Edmund A. Crenshaw, on February 19, 1894, after but a very brief illness, was a severe blow to him, from which he never recovered. His friends noticed the change and endeavored to induce him to take a much-needed rest, but as long as strength permitted he insisted upon daily visiting the store and attending to business.

Finally, with body weakened and strength consumed by years of activity, his will could no longer dominate exhausted nature, and he was compelled to take to his bed. His last illness extended over a period of five weeks, and while complicated with phlebitis and an attack of pneumonia, his decease was really due to physical exhaustion. He passed away from this life peacefully at his home, 1017 Clinton Street, Philadelphia, on March 21, 1900, and interment was made at Wilmington, Del., March 24th.

"Sure the last end
Of the good man is peace! How calm his exit!
Night dews fall not more gently to the ground,
Nor weary worn-out winds expire so soft.
Behold him in the even-tide of life—
A life well spent—whose early care it was
His riper years should not upbraid his green:
By unperceived degrees he wears away;
Yet, like the sun, seems larger at his setting."

G. M. B.

ATMOSPHERIC OZONE.

By R. A. Hatcher, M.D., and H. V. Arny, Ph.D.

Having made some quantitative estimations of atmospheric ozone in the neighborhood of Covington, La., intended for use in an article upon that place as a health resort, the literature upon the subject proved such a surprise to the authors that a separate article was deemed timely.

Though the "electrical odor" which we attribute to ozone had long been known, and Van Marum had, in 1785, passed a current through oxygen, producing a substance, some of the characteristics of which he studied, to Schönbein is due the credit of stimulating research upon this difficult subject.

Dr. Andrews (*Phil. Trans.*, 1855–56, 1–3) showed that ozone was denser than oxygen, and, in the following year, Odling gave its molecular formula as O_3.

Soret (*Ann. Chem.*, XIII, 257) confirmed this in 1865 by removing one-third of the oxygen from ozone with potassio-mercuric iodide, while he removed all the ozone from its admixture with air, by means of oil of turpentine.

Sir Benj. Brodie further confirmed Odling's formula by showing that three volumes of oxygen are condensed to two volumes of ozone, and that ozone has one and one-half times the density of oxygen.

Several methods have been suggested for the detection and estimation of ozone. Schönbein's paper is prepared by making a solution of potassium iodide in gelatinous starch paste, spreading this upon paper and drying, this being protected from light and air.

Houzeau (*Pogg. Ann.*, CIX, 180), whose testimony is corroborated by Gianneti and Volta (*Gaz. Chim. Ital.*, IV, 421), found Schönbein's paper unreliable, and recommended (*Ann. Chim. et Phys.*, XXVII, 5) red litmus paper treated with a neutral solution of potassium iodide, ozone liberating potassium hydrate and changing color of paper to blue. He also suggested (*Compt. Rend.*, XLIII, 38, and LII, 527) the use of a solution of potassium iodide for quantitative estimation, the ozone converting a part of the iodide into iodate, hydrochloric acid being added to liberate the iodine, which is estimated in the usual manner with sodium thiosulphate.

Hartley (Watt's Dict.) recommended potassium arsenite for

ozone assay; ozone oxidizing arsenite to arsenate, and the ozone factor is deduced by calculation of loss of arsenite.

The detection and quantitative estimation of ozone in the atmosphere are particularly difficult, because of its minute proportion and by reason of the numerous normal and abnormal constituents of the atmosphere, which interfere with the test. It is, therefore, not surprising that widely varying and even contradictory results are obtained by equally competent observers; not only as to conditions, time of day and season when greatest amount is present, but also as to meteorological changes and maximum amount. Its very source is still a problem, being variously attributed to action of sunlight, to evaporation of moisture (fresh and saline solutions), to electrical discharges (abundantly proven), to plant-life processes; indeed, one authority suggests the moist mucous membrane of the respiratory tract is capable of converting all the oxygen entering the blood into ozone!

The work done by the Michigan Board of Health to determine the presence of atmospheric ozone and its relation to disease or health has been very extensive and along lines which should lead to valuable results. Nicholson (Rep. Mich. Bd., 1880) has made numerous ingenious and interesting observations under conditions of hygienic interest. It is, however, much to be regretted that the unreliable Schönbein paper was used in all his work, thereby vitiating much of his data. For instance, he draws conclusions from the coloration of the paper when placed near charcoal pits and over swamps, despite the fact that Bastaudin has shown that iodine is liberated from potassium iodide by carbonic acid, while Papasogli reports that similar decomposition is accomplished by carbon dioxide (Nat'l Disp., p. 1302). These reactions easily explain the coloration of Schönbein's paper cited above.

In the same manner, Dr. Prestel (Brochure, Dresden, 1865) took daily observations at Emden, from 1857 to 1864, with special reference to influence of winds and of time (day, night or season).

Dr. Ambrook (Rep. Col. Bd. Health, 1877) made similar observations, but with totally different results. To quote his words, "a careful research of the literature at my command has impressed me with the belief that the 'Ghost that Schönbein raised' will not be so easily laid, for a more contradictory set of results, from apparently equally competent observers, is hard to find than is the record about ozone."

When it comes to actual quantitative work, the statistics are even more bewildering. Most careful examination of the literature brought to light but three writers who commit themselves to figures, and in each case the data is strikingly dissimilar.

Houzeau (*Ann. Chim. Phys.*, XXVII, 5) states that the maximum of ozone in the atmosphere is 1 part to 450,000 by weight (or 0·28 milligramme to 100 litres air). Schöne (Brochure, Moscow, 1897) gives amount as varying from 1 to 10 milligrammes to 100 litres air; while H. de Varigny (Smithson. Miscell. Coll., XXXIX, 27) says that the average is 1 milligramme and the maximum is 3½ milligrammes to *100 cubic metres* air. The latter statement, which means 1 to 3½ milligrammes to 100,000 litres, is at such variance with the other figures that we can only consider it as a typographical error.

These references seem to confirm us in the belief that we are among the pioneers in the field of atmospheric ozone assay, and, while conscious of the liability to err, our results are given in the hope of leading to further observations not open to the objections to which Schönbein's paper is subject. Most strongly is it hoped that the national government may take up this important work, as it is an undertaking almost beyond the scope of a single observer.

Two methods of ozone assay were employed: Hartley's, in which the arsenite is oxidized to arsenate by the following reaction: $KAsO_2 + O_3 = KAsO_3 + O_2$; second, Houzeau's, in which potassium iodide is oxidized to iodate, by the following method: $KI + 3O_3 = KIO_3 + 3O_2$.

The solution of potassium arsenite (corresponding to 3 grammes arsenite to 1 litre) was prepared by heating in water 1·966 grammes arsenious acid and 1·465 grammes potassium carbonate, bringing finished solution up to 1,000 c.c. Of this, portions of 20 c.c. were placed in glass stoppered bottles for the ozone test, enough space being left in each bottle for the addition of wash liquid.

The solution of potassium iodide was made by dissolving 100 grammes of the iodide in enough water to make 1,000 c.c., and portions of 20 c.c. were placed in bottles, as in the case of the arsenite.

These bottled solutions were sent to Covington, La., and the passage of air through each was performed around a hotel situated on the bank of a small stream, about a mile from the village. A significant difference, however, lay in the fact that, in February, the

apparatus was placed on the veranda, while in March it was located in the yard, at least 50 feet from the house. This difference, though small, had an undoubted influence on the circulation of air and is important in explaining the smaller amounts of ozone found in February. In Covington, as elsewhere, March is the most windy month of the year. In February the air was comparatively still, but our notes show that on the 27th—date of maximum ozone of the month—it was quite windy.

The absorption of a definite amount of air was accomplished by siphoning a definite quantity of water from an air-tight container, fitted with a rubber cork, through which passed two glass tubes, one serving as the siphon, the other to admit air. To the inlet tube was attached an appropriate potash bulb—Mohr's or Liebig's—preference being given the former.

As containers, a 26-gallon oak barrel and a 10-gallon tin can were employed, the latter proving more satisfactory, because more convenient to handle and less prone to leakage. The measurement of the siphoned water (of course the volume of air admitted was identical to that of the water removed) was accomplished in two ways: (1) By measuring the amount actually siphoned off; (2) by placing a definite quantity of water in the container and then measuring the quantity left after the siphon ceased to run. Both methods gave practically identical results, and, as the latter was more convenient, it was usually employed.

Each solution was directly transferred from its bottle to the absorption bulb by suction, the traces of the solution clinging to the outer lip of the bulb being carefully washed back into the bottle with distilled water. The bulb was immediately attached to the siphoning apparatus by a rubber joint, the flow of air regulated to 100-150 bubbles a minute and continued until the desired amount had passed through the solution.

As the value of both methods of assay—the iodide and the arsenite—has been assailed on the ground that similar oxidizing effect might result from the acid constituents of the atmosphere, it was deemed expedient in some of the tests to first pass the air through a solution of soda. Such tests are marked with an asterisk in the appended tables, and it will be noticed that our figures show that the criticism is groundless.

After the air had passed through the solution, the contents of the

bulb were returned to the original bottle, it being necessary to employ a porcelain capsule for this purpose. The bulb and capsule were repeatedly washed with distilled water, the washings added to the solution in the bottle and the filled and securely stoppered bottles returned to Cleveland, for titration. Of each separate batch of solutions handled, one bottle each, of the iodide and of the arsenite, was returned to Cleveland as it had been sent—unopened. These solutions, as well as the original solution remaining in Cleveland, were used as control, the solutions in the unopened bottles having undergone all the vicissitudes of their fellows, save the actual absorption of air.

To each of the potassium arsenite solutions was added 2 c.c. of a 10 per cent. solution of ammonium carbonate and 2 c.c. of a 1 per cent. starch paste. Then it was titrated with $\frac{1}{40}$ normal iodine V. S. It was noted that the color first appearing faded after about fifteen minutes, and a few extra drops were added to give a lasting color.

The following explains the calculation of the amount of ozone:

$KAsO_2$; molecular weight, 145·85. O_3; molecular weight, 47·88.

Since one molecule of ozone is required to convert one molecule potassium arsenite to arsenate, 145·85 grammes $KAsO_2$ equals 47·88 grammes ozone, or 1 gramme arsenite equals 0·3287 gramme ozone.

The U.S.P. says that 1 c.c. $\frac{1}{10}$ normal iodine V. S. equals 0·004942 gramme As_2O_3, and since $2KOH + As_2O_3 = 2KAsO_2 + H_2O$, we deduce that 1 c.c. $\frac{1}{10}$ normal iodine V. S. equals 0·007292 gramme $KAsO_2$; the molecular weight of $2KAsO_2$ (291·7) being to that of As_2O_3 (197·68) as 0·007292 is to 0·004942. Since 1 c.c. $\frac{1}{10}$ normal iodine V. S. equals 0·007292 gramme $KAsO_2$, and since 1 gramme $KAsO_2$ equals 0·3287 gramme ozone, it follows that 1 c.c. $\frac{1}{10}$ normal iodine V. S. indicates 0·0023968804 gramme ozone, and the difference between the amounts of iodine V. S. required in titrating the original solution and that acted upon by the atmospheric ozone indicates the amount of ozone acting upon the $KAsO_2$; hence, in the table given below only the difference in cubic centimetres is given, it being understood to represent, in each case, a diminution of arsenite and increase of arsenate. As $\frac{1}{40}$ normal iodine V. S. was employed, each cubic centimetre in the table indicates but $\frac{1}{4}$ of 0·0023968804, or 0·00059922 gramme ozone.

The potassium iodide solutions were treated with a very dilute hydrochloric acid (2 c.c.) and starch paste (2 c.c.), and then were titrated with $\frac{1}{100}$ normal sodium hyposulphite V. S., according to pharmacopœial directions. This method is based on the following reactions, given by Schwanert (*Pharm. Chem.*, I, 292):

$$3O_3 + 6KI + 3H_2O = \frac{3I_2 + 6KOH + 3O_2}{5KI + KIO_3 + 3H_2O}$$

Add to this,

$$\frac{6HCl}{3I_2 + 6KCl + 3H_2O}$$

Hence, $3I_2$ equals $3O_3$, or I_2 equals O_3, or 253·06 grammes iodine equals 47·88 grammes ozone, or 1 gramme iodine equals 0·1889–0·1890 gramme ozone.

One cubic centimetre $\frac{1}{100}$ normal hyposulphite V. S. equals 0·0012653 gramme iodine.

One gramme iodine equals 0·1889 gramme ozone; hence, 1 c.c. $\frac{1}{100}$ normal hyposulphite V. S. equals 0·000239 gramme ozone.

As in the case of the arsenite, the figures given in the following table are for the difference only, and the results are expressed in milligrammes. The accuracy of this iodide assay has been questioned, but the close similarity of its results to those from the arsenite assay leads us to believe that both methods are reliable.

The results of the fifteen assays are tabulated below:

TABLE No. I.

TABLE OF ESTIMATIONS WITH SOLUTION OF POTASSIUM ARSENITE.

Solution No.	Date.	Litres of Air Passed.	Hours in Passing.	Difference in Cubic Centimetres of $\frac{n}{40}$ I. V. S.	Ozone (Milligrammes) Indicated.	Ozone (Milligrammes) per 100 Litres of Air.
I.	February 21	37·640	7·	·40	·24	·63
II	" 24	68·210	9·25	·65	·39	·57
III.	" 26	78·672	10·5	·20	·12	·15
IV	" 27	37·400	8·	·70	·42	1·12
*V	" 28 to March 1	97·752	16·75	·70	·42	·43
*VI	" 20	77·876	9·	·40	·24	·30
*VII	" 21	77·651	9·	4·30	2·57	3·30
*VIII	" 22–23	73·246	15·5	4·20	2·52	3·45
*IX	" 26–29	349·637	70·	·50	·30	0·085

TABLE No. II.

TABLE OF ESTIMATIONS WITH SOLUTION OF POTASSIUM IODIDE.

Solution No.	Date.	Litres of Air Passed.	Hours in Passing.	$\frac{n}{100}$ V. S. Sod. Hypo. in Cubic Centimetres.	Ozone (Milligrammes) Indicated.	Ozone (Milligrammes) per 100 Litres of Air.
I	February 22	67·824	8·5	·15	·035	·050
II	" 23	75·832	10·	·05	·012	·015
*III	March 16	37·026	8·	24·5	5·85	15·810
*IV	" 17	75·414	10·	20·2	4·83	6·40
*V	" 19	77·612	9·	11·2	2·67	3·45
*VI	" 23-25	194·564	57·	25·7	6·14	3·16

In conclusion, we wish to say that the assays are deemed of as much value qualitatively as quantitatively, the mere presence of ozone, with a reasonable degree of constancy, indicating an atmosphere free from miasmatic emanations or other impurities deleterious to life. At the same time it may be that ozone, coupled with a mild and balmy climate, has some directly antizymotic influence; in fact, the Michigan Board of Health reports seem to indicate conclusively that ozone and zymotic diseases exist in directly inverse ratio.

Lastly, our assays were made without special reference to meteorological conditions, and it is to be hoped that further investigations, with these conditions in view, will soon be made. Such work the authors hope to undertake in the near future.

CLEVELAND, O., July, 1900.

SOME OF THE UNPUBLISHED RESULTS OF THE INVESTIGATION OF THE TANNINS BY THE LATE PROFESSOR HENRY TRIMBLE.

COMPILED FOR PUBLICATION BY JOSIAH C. PEACOCK.

(*Continued from page 342.*)

CUPULIFERÆ.

Castanea Pumila.—A sample of this tree secured from a nursery near Philadelphia, in March, 1896, showed the following results:

	Moisture.	Ash in Absolutely Dry Material.	Tannin in Absolutely Dry Material.
Root bark	7·57	5·91	17·18
Stem bark	7·03	4·79	6·36

The ashes were composed of potassium, calcium, and iron as carbonates, sulphates and phosphates.

Fagus Ferruginea.—A sample of bark from the common beech, Fagus ferruginea, collected at Haddonfield, N. J., on June 27, 1893, yielded the following results: Moisture, 29·33 per cent.; and tannin in the absolutely dry bark, 2·44 per cent. The properties of the tannin found in this bark, as displayed by qualitative reactions, indicate its similarity to the members of the oak bark group of tannins.

Carpinus Americana.—A sample of bark from Carpinus americana was collected at St. David's, Pa., on June 27, 1894. It showed the following quantities: Moisture, 10·14 per cent.; ash in absolutely dry bark, 10·43 per cent.; tannin in absolutely dry bark, 3·67 per cent.

Alnus Serrulata and Alnus Rubra. Barks from two species of Alnus were examined. The bark of Alnus serrulata was collected at St. David's, Pa., on July 13, 1895. The bark of Alnus rubra was received from Prof. F. E. Lloyd, Forest Grove, Ore.; it was gathered on October 5, 1895. The results were as follows:

Species.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.
A. serrulata	15·88	6·49	6·05
A. rubra	7·66	5·31	9·84

It is reported that the bark of Alnus rubra is used for tanning in the vicinity of Forest Grove, that the color of the leather produced with it is light, and the quality apparently as good as that tanned with hemlock or spruce bark.

Quercus.—In order to determine the value of the inner and outer bark of the chestnut oak, Quercus prinus, a lot of bark was collected from the trunk of a medium-sized tree, near the ground. The trunk was about 8 inches in diameter. The bark was carefully separated into the two layers. The respective portions showed the following figures:

	Inner Bark.	Outer Bark.	Entire Bark.
Moisture	14·83	14·14	15·05
Ash in absolutely dry bark	1·63	1·41	1·65
Tannin in absolutely dry bark	11·12	7·16	10·59

Specimens of the bark of Quercus arizonica and Q. oblongifolia were furnished by Professor Toumey, of Tucson, Ariz. Professor

Lloyd, of Forest Grove, Ore., sent a sample of the bark of Q. garryana. A sample of the bark of Q. macrocarpa was collected near Springfield, O., by W. E. Ridenour, and a sample of the bark of Q. virens was obtained through Dr. Mohr, of Alabama. The following results were obtained:

Species.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.
Q. arizonica	7·77	20·65	5·88
Q. oblongifolia	8·97	19·17	8·39
Q. macrocarpa	10·19	8·53	13·65
Q. garryana	4·91	11·65	6·16
Q. virens	9·96	6·58	3·55

The tannins of all of the barks gave qualitative reactions like those of the members of the oak bark group already reported by Professor Trimble. The tannin of Quercus garryana showed 59 66 per cent. of carbon, and 5·55 per cent. of hydrogen, establishing its relationship to the members of the oak bark group of tannins. The ash of Q. garryana consisted almost exclusively of calcium phosphate.

Acorns of Quercus Reticulata.—A sample of the acorns of this species of oak was supplied by Professor Toumey, of the Agricultural Experiment Station at Tucson, Ariz. The pericarp was removed from the kernel, and each part estimated separately with the following results:

	Pericarp.	Kernels.
Moisture	5·81	6·80
Ash in absolutely dry	2·60	4·04
Tannin in absolutely dry	3·08	4·20

The ash of both parts contained aluminum, calcium, magnesium, potassium, iron and manganese, combined with phosphoric, hydrochloric and sulphuric acids; that of the pericarp contained silicic acid in addition to the foregoing.

EUPHORBIACEÆ.

Jatropha Cardiophylla.—A supply of the roots and stems of Jatropha cardiophylla, Muell., was received from Prof. J. W. Toumey on March 4, 1896. This gentleman also sent the following description: "An abundant shrub on the dry foothills of southern Arizona and Sonoræ. You will observe the beautiful rich color of the root and stems. This color I am told is imparted to the leather in tanning. This plant is probably the most abundantly used by the Indians and Mexicans for the purpose of tanning of any of our native plants. It has the reputation of producing an exceedingly fine leather of superior quality. The plant is known to the Mexicans as 'Sangre de Drago.'" An estimation of the material showed the following percentages:

	Per Cent.
Moisture	7·12
Ash in absolutely dry	4·95
Tannin in absolutely dry	5·27

Rhizophoreæ.—The following mangrove barks were received from Dr. H. N. Ridley, of the Botanic Gardens at Singapore, who wrote as follows: "The mangrove barks I sent all grow in the mangrove swamps, and all but Carapa belong to the Rhizophoreæ. Carapa is a Meliaceæ. The mangrove swamps consist of tidal mud, covered with a thick growth of the trees which I sent the bark of; to which may be added Aircennia and the Sonneratias and Heritiera. There is little else there excepting epiphytes on the mangrove trees. Nearly all these trees contain, or may be expected to contain, tannin, which no doubt protects them from injury by the sea water. But the only ones used for tanning are those I sent you. Indeed, Carapa is not used in this way, but as an astringent for dysentery. Ceriops is considered far the most valuable for tanning, and in addition is used for dyeing cloth."

The barks have the following names, and are from the respective sources:

Akit, Rhizophora conjugata.
Tumu, Bruguiera rheedii.
Lenggadi, Bruguiera parviflora.
Supsup, Sumnitzera coccinea.
Belukop, Rhizophora mucronata.
Tengah, Ceriops candolleana.
Bosing, Bruguiera caryophylloides.
Nirch, Carapa mollucana.

The estimation of these barks showed the following figures:

Name.	Moisture.	Ash in Absolutely Dry Bark.	Tannin in Absolutely Dry Bark.
Rhizophora conjugata . . .	6·71	9·58	17·90
Bruguiera caryophylloides .	6·59	9·55	8·96
Rhizophora mucronata . . .	7·00	8·80	19·57
Bruguiera parviflora	7·68	7·37	7·98
Bruguiera rheedii	8·11	7·24	19·37
Sumnitzera coccinea	9·01	7·53	11·75
Carapa mollucana	9·29	10·23	27·56
Ceriops candolleana	7·22	10·21	24·19

ROSACEÆ.

Potentilla Norwegica and Potentilla Canadensis.—The material for the work upon Potentilla norwegica was collected near St. David's, Pa., on August 26, 1896. The several parts were separated as indicated in the following tabulation of results:

	Root.	Stem.	Leaves and Flower-heads.
Moisture	9·55	10·75	17·20
Ash in absolutely dry material	6·30	4·31	9·96
Tannin in absolutely dry material	2·22	0·45	4·13

The ashes of the several parts consisted of magnesium, calcium, potassium and iron combined with carbonic, sulphuric, hydrochloric and phosphoric acids.

On May 24, 1894, some leaves were collected from Potentilla canadensis, at St. David's, Pa. These upon estimation showed:

	Per Cent.
Moisture	72·13
Ash in absolutely dry material	9·90
Tannin in absolutely dry material	13·34

BRAIN MATTER IN MILK.—Henry Leffmann records the adulteration of calves' and sheep's brains in milk, and considers the adulteration a dangerous one because of the liability of the brain to contain virulent microbes and the localization there of certain stages of dangerous entozoa.—*Jour. Amer. Chem. Soc.*, 1900, p. 356.

RECENT LITERATURE RELATING TO PHARMACY.

THE TESTING OF ACETONE.

Crude acetone may contain a number of undesirable ketones which occasionally find their way into the purified article, and our present analytical methods are generally deficient for making proper deductions. Most of the methods not only estimate the acetone, but also include other homologous ketones and associated bodies.

A good acetone should mix clear with distilled water and when evaporated at 100° C. should not leave any residue. Its specific gravity should not exceed 0·800 at 15·5° C. and four-fifths of the quantity taken, by volume, must distil at a temperature not exceeding 59° C. The acetone should not contain more than 0·005 per cent. of acid, calculated as acetic acid, which is estimated by diluting 50 c.c. of the acetone with an equal volume of distilled water, adding 2 c.c. of phenolphtalein solution, and titrating with N/100 sodium hydrate. On adding 1 c.c. of a $\frac{1}{10}$ per cent. solution of potassium permanganate to 100 c.c. of the acetone, a distinctive color must be retained for at least thirty minutes.—Mr. James T. Conroy, *J. Soc. Chem. Ind.*, 1899, *19*, 206. L. F. KEBLER.

THE IODINE VALUE OF OILS.

Literature is teeming with results on the iodine value of oils, yet the exact nature of the reactions of the various methods proposed is obscure. Wijs' proposition (*Ber. deut. chem. Gesel.*, 1898, *31*, 750) to employ a solution of iodine monochloride in acetic acid in place of Hübl's solution marks a distinct advance in the practical execution of such determinations. Wijs' solution is rapid in reaction, nearly permanent, and Lewkowitsch has shown (*Analyst*, 1899, 257) that it gives the same iodine values as Hübl's solution.

Ephraim (*Ztsch. angew. Chem.*, 1895, 254) thought and even Wijs himself (*Ztsch. anal. Chem.*, 1898, 277) was of the opinion that with Hübl's solution the iodine monochloride was added directly to the unsaturated acid radical. Wijs now thinks that the iodine chloride reacts with water as follows: $ICl + H_2O = HIO + HCl$; the hypoiodous acid formed is then added to the unsaturated radical; $C_{17}H_{33}CO_2H + HIO = HIOC_{17}H_{33}CO_2H$, which addition product subsequently reacts with the hydrochloric acid,

formed in the first equation, thus completing the reaction, $HIOC_{17}H_{33}CO_2H + HCl = ClIC_{17}H_{33}CO_2H + H_2O$.

Mr. Arthur Marshall, the author of this paper, differs with Wijs as to the above theoretical reactions, claiming that the same results can be secured without the intervention of water. He proves this by making a solution of iodine monochloride in dry carbon tetrachloride, applying it, and on comparing the results obtained by this solution, with those obtained by Hübl's and Wijs' solutions, finds that almost identical results are obtained.—1899, *J. Soc. Chem. Ind.*, *19*, 213. L. F. K.

PHILADELPHIA HOSPITAL FORMULARY.

(*Continued from page 356.*)

PULVERES.

Pulveres Acetanilidi Compositi.

Each powder contains:

Powd. Acetanilide,		
Sodium Bicarbonate, of each	2·5 gr.	0·15 gm.

Dose: One or two powders.

Pulveres Caffeinæ Compositi.

Each powder contains:

Caffeine (Alk.)	1·5 gr.	0·1 gm.
P. Acetanilide	2·5 gr.	0·15 gm.
Sodium Salicylate	5 gr.	0·3 gm.

Dose: One or two powders.

Pulveres Bismuthi.

Each powder contains:

Bismuth Subnitrate,

5 gr.	10 gr.	15 gr.	30 gr.
=0·3 gm.	0·6 gm.	1 gm.	2 gm.

Dose: One powder.

Pulveres Bismuthi et Bismuthi.

Each powder contains:

Bismuth Subgallate	5 gr.	0·3 gm.
Bismuth Subnitrate	15 gr.	1 gm.

Dose: One or two powders.

Pulveres Bismuthi Cum Kino.

Each powder contains:

Powd. Kino	10 gr.	0·6 gm.
Powd. Cinnamon	10 gr.	0·6 gm.
Bismuth Subnitrate	10 gr.	0·6 gm.
Bismuth Subgallate	5 gr.	0·3 gm.

Dose: One powder every 2 or 3 hours.

Pulveres Bismuthi Cum Soda.

Each powder contains:

Bismuth Subnitrate	10 gr.	0·6 gm.
Sodium Bicarb.	10 gr.	0·6 gm.

Dose: One or two powders.

Pulveres Mercurosi Compositi.

Each powder contains:

Mercurous Chloride, Mild	$\frac{1}{12}$ gr.	0·005 gm.
Powd. Ipecac	$\frac{1}{12}$ gr.	0·005 gm.
Powd. Black Pepper	½ gr.	0·032 gm.
Sodium Bicarb.	2 gr.	0·13 gm.

Dose: One powder every two hours until six are taken, followed by a saline purgative. J. W. E.

Pulveres Morphinæ Sulphatis.

Each powder contains:

Morphine Sulphate	⅛ gr. = 0·008 gm.	¼ gr. 0·016 gm.

Dose: One powder.

Pulveres Pancreatini Cum Soda.

Each powder contains:

Pancreatin	5 gr.	0·3 gm.
Sodium Bicarb.	10 gr.	0·6 gm.

SUPPOSITORIA.

Suppositoria Acidi Tannici.

Each suppository contains:

Acid Tannic	5 gr.	0·3 gm.

Dose: One suppository.

Suppositoria Iodoformi.

Each suppository contains:

Iodoform	5 gr. = 0·3 gm.	2 gr. 0·6 gm.

Dose: One suppository. P. H.

Suppositoria Opii.

Each suppository contains:

Powdered Opium	½ gr. = 0·032 gm.	1 gr. 0·065 gm.	2 gr. 0·13 gm.

Dose: One suppository.

Suppositoria Opii et Belladonnæ.

Each suppository contains:

Powd. Opium	1 gr.	0·065 gm.
Ext. Belladonna	¼ gr.	0·016 gm.

Dose: One suppository.

Suppositoria Opii et Plumbi.

Each suppository contains:

Powd. Opium	1 gr.	0·065 gm.
Lead Acetate	3 gr.	0·2 gm.

Dose: One suppository.

Suppositoria Quininæ.

Each suppository contains:

Quinine Sulphate	5 gr.	10 gr.
	= 0·3 gm.	0·6 gm.

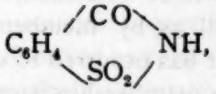
Dose: One suppository.

CHEMISTRY AND TASTE.

An interesting problem is suggested by Dr. W. Sternberg (*Verh. Physiol. Ges*, through *Ap. Zt.*, 1899, 184) in his endeavor to show connection between the relative taste of a substance and its chemical formula. His theory is that substances are sweet when they consist of atomic groups bearing to taste the same relation as a harmonic chord does to hearing. Such influencing groups he calls "sapiphores," and when these sapiphores are mated discordantly, a bitter product results. As sapiphores, the writer mentions the hydroxyl, the amino and the nitro groups, and, as types of harmony of taste, he suggests the following unions:

The negative hydroxyl, with a positive alkyl group; thus, glycerin (C_3H_5OH) is sweet.

The positive amino with the strongly negative carboxyl; thus, saccharin,



is sweet.

As discords, he cites the following:

Negative hydroxyl with negative phenyl. This is seen in bitter glucosides, which are combinations of glucose hydroxyls with phenyl compounds.

The positive amino groups with other positive groups, as shown in the alkaloids.

The most important point in the writer's theory is that all sweet substances have a double nature—consist of neutral combinations of positive and negative groups or atoms. The writer claims his theory applies to inorganic as well as organic bodies, and further developments will be awaited with interest. H. V. Arny.

EDITORIAL.

THE NEEDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

It has been said of Daniele Manin that he was made a delegate to a convention in Italy, where the subject of the improvement of that country was to be considered, and in particular the subject of the introduction of railroads. Manin protested that he should not be appointed a delegate, as he knew nothing about railroads; but finally he accepted the honor and attended the convention to please his friends. In the discussions which followed he was called upon for an opinion and said: "Gentlemen, I know nothing about railroads, but I do know something about the needs of Italy. What Italy needs is not railroads, but liberty."

It seems to us that in institutions and associations, as well as in nations, the greatest evils arise from the fact that the members do not recognize or attend to the fundamental needs of those whom they would benefit.

In a previous editorial (this JOURNAL, 1900, p. 356) the peculiar province of the American Pharmaceutical Association was considered, and it was suggested that it might be well to distribute copies of Article I of the constitution of the Association among the retail pharmacists of the United States. Since it was considered desirable or necessary to appoint a committee to consider measures for bettering the welfare of the Association, it is all the more evident that a discussion of this subject will be welcomed, no doubt, by the members of this committee as well as by members of this Association. In considering this matter, it has occurred to us that what this Association needs to increase its membership from *retail pharmacists* is a concentration of its energies particularly in two or three directions:

(1) The development of the new section on Pharmacy and Dispensing; (2) the concentration of considerable energy in its Commercial Section; and (3) looking after the Legislation in Pharmacy.

If, in the first instance, the problems relating to the general practice of pharmacy were discussed; and, in the second, the methods of increasing general, and particularly the prescription, trade were considered, and finally, in the third, matters pertaining to the laws relating to poisons, pure foods, etc., were to be debated and a consensus of opinion developed, we cannot but believe that the Associ-

ation would be considering some of the vital principles connected with its life. Fortunately, too, there are men ready and able to do this work, and it would pay the Association to consider the outlay of a little money, if necessary, to concentrate its energies along these lines.

While the N.A.R.D. promises much as a trade organization, it cannot do that work which will result in the ultimate good to pharmacy that should and must emanate from an organization like the A.Ph.A. The N.A.R.D. is working rather for temporary relief. The regulation of prices on proprietary and other popular preparations is of some moment, it is true, but the time is not far distant when proprietary medicines will play a very subsidiary part in the equipment and revenue of the pharmacist. There are far more important questions which lie at the heart and core of pharmacy than those considered by the N.A.R.D. at present. It is opportune indeed that the Association now put the proper men in harness and keep them there (and pay them if necessary) to ascertain and understand the needs of the apothecary at this time. It is a matter of education and not trade only. It is rather an adjustment to conditions and not the consideration of prices merely. In short, what is needed is liberty, first, to secure the proper and necessary education as an apprentice, and second, freedom to exhibit the strength of character that becomes the professional man. It is not only the regulation of charges that is needed. This will expedite business, but the profession must be there or there can be no solution to these momentous questions. Let the members of the Association not be deceived as to questions of economy and let them remember that the retail pharmacist cannot be inspired by an exhibition merely of some one else's products and inventions. What he needs is to be shown at college and at associations some of the *real* difficulties in pharmacy and how they can be overcome. He must be organized and led in the path of confidence by men of character—the strong leaders of this great Association.

PILOCARPUS RACEMOSUS of the French Antilles is given by Rocher as a new source of jaborandi. The leaves contain 0·6 per cent. of pilocarpine and 0·4 per cent. of jaborine. According to H. A. D. Jowett, the following alkaloids are present in jaborandi: pilocarpine, iso-pilocarpine (pilocarpidine of Petit and Polonowski), pilocarpidine (Harnack and Merck).

THE BRITISH PHARMACEUTICAL CONFERENCE.

The thirty-seventh annual meeting of the British Pharmaceutical Conference was held during the week of July 24, 1900. The meeting was held in London, and this is the second time in the history of the Conference that the meeting was held in this, one of the great cities of the world. The President of the Conference gave a very practical address, and one that is deserving the consideration of pharmacists of not only Great Britain, but of the United States as well. The account of the Conference which we give the readers of this JOURNAL has been taken from the *Pharmaceutical Journal*, July 28, 1900, which contains the President's address, and most of the papers in full.

PRESIDENTIAL ADDRESS.

By E. M. Holmes.

After dwelling briefly upon the progress of pharmacy during the century, Mr. Holmes says, regarding the subject of *counter prescribing:*

"It has been stated by medical men that what is known as counter prescribing by pharmacists is one of the causes why dispensing is not entirely handed over to the latter by the medical profession. The subject is no doubt surrounded with practical difficulties, but probably these are not insuperable. There is no law to prevent a man, however ignorant he may be, from prescribing remedies for himself, his friends, or his household, and it has been stated on high medical authority that it would not be objectionable for persons to apply at a pharmacy 'for simple remedies for toothache, muscular pain, or trifling dyspeptic ailments, provided the person seeking relief knew what he was about, and was not deceived by the assumption of an authority, or of titles, on the part of the chemist, and provided that such relief was merely to be regarded as first aid, or a temporary expedient for a definite complaint stated by the patient. But this is a very different state of things from what is known as a prescribing business, in which the chemist goes beyond his province in diagnosing disease and supplying remedies for it. In such business the straightforward plan would be for the proprietor to qualify as a medical practitioner, or to arrange with a properly qualified man to see his clients. The

converse of this is the medical practitioner who keeps open shop like a chemist, and to whom is largely due the difficulty that the uneducated public find in distinguishing between a chemist's and a doctor's shop. It might be possible, perhaps, for representatives of the medical profession and the Pharmaceutical Society to arrange a Conference to make mutual provisions for counter prescribing by chemists to cease on the one hand, and the keeping open shop by doctors on the other. This would need disciplinary powers for both bodies to deal with offenders, but the two bodies united could probably, by a good organization, bring sufficient influence to bear upon the Government to pass an Act authorizing such powers."

In considering the subject of *portable medicines* the President said:

"The increase in the rapidity of travelling and the absence of an international Pharmacopœia have caused a demand for portable medicines, which has been increased by the opening up of new countries where it is impossible to obtain medicine, so that a new industry in this direction has been developed, in which English pharmacists, with characteristic conservatism, have allowed Americans to take the lead. The great advantage in the saving of time by the use of portable medicines to both the medical practitioner and the patient—in country districts where there is no chemist within several miles, and where the considerable delay in the delivery of medicine, by reason of the distance, is often of serious importance—is almost certain to lead to the permanent adoption of such time- and labor-saving devices. The value to the public of portable medicines for travelling purposes cannot be denied, as well as to the Government, since in military and naval operations the sudden demands made upon medical stores and appliances necessitate the use of drugs and preparations occupying as little space as possible, in a form as concentrated as is compatible with safety, and not readily affected by the vicissitudes of climate. This form of medicine has, therefore, become a feature of the pharmacy of to-day, and is likely to develop still further. It has, however, the disadvantage of placing in the hands of the laity powerful remedies which they are apt to use without proper medical advice, and without the ability to judge of the nature of the disease for which they employ them."

The *limitations of the Pharmacopœia* were summed up in the following words:

"The vast number of new vegetable, chemical and animal remedies introduced during recent years, and the impossibility of keeping pace with them, on the part of the medical men and the pharmacist, especially in the provinces, where, as a rule, new remedies do not come into use until two or three years after introduction into city practice, has led to the comparative disuse of the Pharmacopœia for prescribing purposes, and to more dependence being placed by physicians, concerning new remedies, upon such works as Martindale's 'Extra Pharmacopœia' and Squire's 'Companion to the British Pharmacopœia,' works which enterprising pharmacists have produced to meet the necessities of medicine and pharmacy during the time that elapses between the publication of one Pharmacopœia and another. These works have also the additional advantage that they contain tables of diseases, and of all the most modern remedies used for them, as well as the doses and formulæ showing useful combinations of the various preparations. In these rapidly progressive times the Pharmacopœia cannot, even if published decennially, be actually up to date; it can only crystallize into a definite shape formulæ that have already been in use for some time. The Pharmacopœia is now really more used by pharmacists as a standard for insuring uniformity in official preparations than by physicians for prescribing purposes."

In regard to the Pharmacopœia being looked upon as a *legal standard*, Mr. Holmes says it is not to be used as a legal standard of purity for drugs used in commerce for domestic and technical purposes.

"To prosecute chemists," says he, "because, for instance, tincture of myrrh, which is used as a dentifrice rather than as a medicine, or benzoin, which is used in French polish, etc., or soft soap, or ammonium carbonate, soda water, or other articles in regular household use do not answer to the tests of purity of the B.P., would constitute an interference with trade that would be as absurd as it would be vexatious. That the standard of purity used in dispensing physicians' prescriptions should be as high as it is possible to make it, is an article of faith of the B.P.C., but there are many cases in which drugs and preparations which are B.P. articles are used for other than medical purposes, and for such the average of normal condition of purity meets all the requirements of the case."

Concerning an *International Pharmacopœia*, Mr. Holmes says

there is no reason why an approach to making a practical and useful work should not be made, and that a gradual growth is necessary for the perfection of the book.

The subject of *commercial education* was referred to in a rather forceful and beneficial way. Recognizing that it is next to impossible for the pharmacist to divorce his business from his profession, the President says:

"What they most need is a commercial education, instructing them in business methods and modern requirements. This has not hitherto formed part of a pharmacist's education, and therefore the importance of the course of commercial education which has been started in some of our universities, and already forms an optional subject in the Philadelphia College of Pharmacy, cannot be overestimated—at all events for those chemists and druggists who have to depend chiefly upon the sale of miscellaneous chemical and other articles rather than on dispensing. The conditions which have hitherto obtained in the retail trade of chemists and druggists have not during the last fifty years been favorable for acquiring a useful knowledge of business methods."

The Chemistry of the British Pharmacopœia.

By Frederick B. Power.

The author has, on experimental work, brought together a number of observations on the chemistry of the B.P., and has brought forth a number of suggestions which are none other than of a constructive character for this and other Pharmacopœias. The chemicals considered are: Acetanilide, glacial acetic acid, arsenious acid, benzoic acid, boric acid, citric acid, gallic acid, hydrobromic acid, phosphoric acid, salicylic acid, sulphuric acid, tannic acid, aconitine, amyl nitrite, atropine, bismuth carbonate, bismuth salicylate, borax, caffeine, caffeine citrate, calcium hypophosphite, cerium oxalate, chloral hydrate, chloroform, cocaine hydrochloride, codeine, cotton, creosote, saccharated iron carbonate, iron and quinine citrate, exsiccated ferrous sulphate, reduced iron, tartrated iron, lithium carbonate, lithium citrate, magnesium carbonate, menthol, morphine hydrochloride, expressed oil of almond, oil of cloves, oil of cinnamon, oil of copaiba, castor oil, physostigmine sulphate, pilocarpine nitrate, potassium tartrate, acid quinine hydrochloride,

quinine sulphate, sodium arsenate, solution of lead subacetate, sulphur, terebene and veratrine.

The B.P. as a Standard.

By D. B. Dott.

The author is of opinion that, although the B.P. is admittedly the standard according to which pharmacists are bound to prepare all medicines which are official, the medicines must only be regarded as being of official standard when they are dispensed to the order of a physician, or where the conditions and circumstances of sale imply that the medicines are of that standard. He also opposes the idea that it should be considered possible to prove the presence of the full amount of any ingredient ordered in the B.P. formula for a given preparation some time after that preparation has been made. Examples are given of a few confused interpretations of the Pharmacopœia regarded as a standard, and it is suggested that a more intelligent and reasonable interpretation of existing laws be required.

Liquor Ferri Phosphatis cum Quinina et Strychnina.

By H. J. Henderson.

As a result of the examination of ten samples of liquor ferri phosphatis cum quinina et strychnina the author showed that all the samples which contained over 4 grammes of alkaloid in 100 c.c. gave unmistakable reactions for chlorides, a circumstance which points to the probable substitution of the acid hydrochloride of quinine for the less soluble sulphate. When it was found that sulphates were conspicuous only by their absence, the supposition received further confirmation. Of the other samples, one differed from the others in that it contained alcohol in considerable quantity, but the small amount of liquor at the disposal of the author made a trustworthy estimation of alcohol impossible. In two samples the alkaloidal contents were 1·30 and 1·25 per cent. respectively. Sulphates were present, but no chlorides were found. In another sample glycerin was found, the glycerin playing the double part of preservative and solvent. All these results tend to confirm the impression that a liquor ferri phosphatis cum quinina et strychnina, one volume of which when diluted with three volumes of simple syrup shall form

a syrup which shall represent the syrupus ferri phosphatis cum quinina et strychnina of the Pharmacopœia, cannot be prepared. Three samples were labelled simply "liquor Easton," pro syrup. They, therefore, could not be understood to represent a liquor with which the official syrup could be prepared.

Tinctures of the British Pharmacopœia.

By J. C. McWalter.

The author gives the results of numerous determinations of the specific gravity of tinctures, and of the weights of residues left after evaporation of known volumes of such preparations. The latter show much greater variation than the specific gravities, and it is suggested that official standards for residues would be of but little use on account of the very wide limits that must be allowed.

Asafetida Preparata.

By H. W. Jones.

In the purification of asafetida the author employs a method of precipitation as follows:

"One part of undried asafetida is treated with five fluid parts of alcohol (90 per cent.) in a closed jar in a water-bath, and solution effected by the aid of a little heat. The liquid portion was filtered off when cold and poured into ten times its bulk of water faintly acidulated with hydrochloric acid. After standing for twenty-four hours the precipitated mass, consisting of resins and essential oil, was collected on a calico filter, washed with water, scraped off into a shallow dish, and exposed to the air for a few days to allow of the evaporation of a small quantity of water appearing on the surface. The possible use of asafetida so prepared would be for pill masses in place of the powder, and it might also be used for the easy preparation of the tincture, in which case the use of rectified spirit, in place of the weaker alcohol now ordered, would be a distinct advantage."

Laboratory Notes.

By F. C. J. Bird.

Liquor Pancreatis, B.P.—The author finds that the test given for verifying the proteolytic activity of official pancreatic solution is not sufficiently definite, and that, at times, it is difficult to determine

the point at which coagulation no longer occurs. To remedy these defects Mr. Bird suggests the use of ether with nitric acid.

Aromatic Spirit of Ammonia.—The barium chloride test for carbonate in aromatic spirit of ammonia may be rendered more accurate by the addition of sodium or ammonium chloride.

Pepsin.—The solubility of pepsin in alcohol (90 per cent.) varies from 17 to 37 per cent.

Liquor Ferri Perchloride Fortis.

By Thomas Tyrer and A. Levy.

The authors consider it probable that manufacturers do not make solutions of ferric chloride according to the method described in the Pharmacopœia, and they confirm the statement that commercial samples of the strong solution cannot be obtained of specific gravity 1·42.

Phenol Suppositories.

By F. R. Dudderidge.

The author deals with the difficulty experienced in removing phenol suppositories from the mould in hot weather. He finds that the presence of white beeswax tends to affect the physical consistence of the suppositories as well as to raise the melting point. Omitting the wax, he was able to prepare much more satisfactory articles, and it is suggested that the official formula should be modified accordingly.

Notes on Opium, Olive Oil and Saccharin.

By E. Dowzard.

Opium.—The amount of morphine in dried and powdered opium varies from 12·3 to 14·9 per cent.

Olive Oil.—An examination of forty samples showed a specific gravity ranging between 0·9155 and 0·9165; seven a specific gravity of 0·915; four a specific gravity of 0·917, and one a specific gravity of 0·9172.

Saccharin.—The two commercial qualities of saccharin are determined by their solubility in acetone.

Mercurous Iodide.

By Frederick B. Power.

The author summarizes the methods which have been advocated for the preparation of mercurous iodide, and gives the results of

determinations of the amount of iodine or pure mercurous iodide contained in specimens of the compound made in different ways. Those results indicate that precipitated mercurous iodide is quite uniform in composition and also sufficiently stable when properly protected.

Copaiba of British Guiana.

By E. W. Bell.

As the result of an examination of a specimen of British Guiana copaiba, the author finds it to respond to all the characters and tests of the British Pharmacopœia, except as regards the optical rotation of the volatile oil, and, in that respect, the B.P. monograph is supposed to be in error. The official tests for copaiba are criticised generally, and it is suggested that there should be a definite method for obtaining the percentage of oil, preferably by evaporation at about 100° C.; it is also suggested that the rotation figures for the volatile oil should be lowered, that titration of the oleoresin be introduced and a resin factor added.

Assay Apparatus for Chlorine or Nitrogen.

By J. F. Tocher.

A new form of apparatus for the determination of chlorine or nitrogen is described by the author. The advantages claimed for it are that loss of chlorine or ammonia is entirely prevented, whilst the condensing apparatus is much simplified, and the fluid and washings can be readily run off for titration, the apparatus then being ready for another operation. In nitrogen determinations the flask can be used with advantage in decomposing the nitrogenous substance prior to distillation and prevents possible loss in transference.

Nux Vomica Assay.

By E. H. Farr and R. Wright.

The authors point out that the volume of liquid taken should not exceed 5 c.c. of liquid extract, or 30 c.c. of tincture, and that 200 c.c. of wash water at a stated temperature (38° C.) should be employed, a correction being made for the strychnine dissolved.

Ash in Drugs.

By C. G. Moor and M. Priest.

As a result of the determination of the ash of a number of B.P. drugs, the authors point out that in a few cases there should be some modification in the official limits—as, for instance, in cardamoms and colocynth pulp. It is suggested that the official ash limits might, with advantage, be considerably extended generally.

Melting Points.

By T. Tyrer and A. Levy.

The substances recently examined by the authors are: salicylic acid, salol, carbolic acid, menthol and thymol. Commercial salicylic acid and thymol stand the B.P. test, but purified salol (recrystallized), carbolic acid and menthol must be taken if the official requirements are to be met. It is pointed out that no single method of determination is applicable to all pharmaceutical substances, and the authors propose to ascertain which methods are most applicable in particular instances.

Berberine Phosphate.

By F. Shedden.

The author gives the composition of this salt as prepared by interaction of berberine acetone and an excess of phosphoric acid, and the interaction of mono-berberine sulphate and acid calcium phosphate as being $C_{20}H_{17}NO_4.2H_3PO_4$, with varying amounts of water of crystallization.

Viscosity of Essential Oils.

By E. Dowzard.

A specimen of pure lemon oil had a viscosity of 139·6, whilst that of citrene was found to be 105·8, and that of a mixture of citrene with 7·5 per cent. of citral was 114·9. Assuming the viscosity of lemon oil to be fairly constant, such a test may be of some value, but examinations of authentic samples are required. The author therefore concludes that useful information may be obtained by determining the viscosity of essential oils.

Turpentine and Terebene.

By C. T. Tyrer and A. Wertheimer.

The authors have made a careful physical examination of American, Russian and French turpentine oils and terebene made therefrom, and propose, at some future date, to investigate similar products from all possible sources. As a general rule, they find that the higher the initial rotation of American turpentine, the smaller is the product of inactive mixture capable of steam distillation and the higher the specific gravity. French turpentine has a greater tendency to oxidize than American, being intermediate between that and the Russian oil. The authors also find that, with proper attention to the conditions of manufacture, the requirements of the B.P. with regard to terebene, when prepared from American oil, can be reasonably complied with. From the results of their experiments the authors are inclined to doubt the existence, under ordinary conditions of manufacture, of a distinct inactive modification of the constituents of American turpentine or of terebene prepared therefrom.

Sandal Wood Oil.

By E. J. Parry.

Sandal wood oil consists of about 90 per cent. *santalol*, which is a mixture of two or more bodies of an alcoholic nature, to one of which the name *santalene* has been applied.

Waste Menthol.

By A. W. Gerrard.

Waste menthol can be economically recovered in a pure state by crystallization from ether.

Almond Oil.

By W. C. Allen and E. T. Brewis.

The authors point out that, inasmuch as different countries—Morocco, Canary Islands, Portugal, Spain, France, Italy, Sicily, Syria and Persia—yield the principal supplies of almonds, we have to deal with the products of seeds grown under varying conditions of climate and soil. They are of opinion that the percentage of fixed oil present in the seeds does not exceed 45 per cent. from

sweet and 38 per cent. from bitter almonds. The almond oil of commerce is chiefly obtained from the latter, and, in view of the differing sources of supply, it is unreasonable to expect absolute uniformity in the results of color reactions, etc., though the differences are only slight, and never reach a limit that would cause difficulty in distinguishing genuine almond oil from adulterated oil. Expression is given to the opinion that adulteration of almond oil is comparatively rare, though substitution by peach or apricot kernel oils is common. These kernel oils, in turn, are adulterated with oils of cotton-seed, sesame, poppy, olive and arachis, only one out of seven representative samples having been recognized as unsophisticated kernel oil.

Strophanthus.

By P. E. F. Perredis.

In a monograph on the pharmacognosy of official strophanthus seed, the author shows that every histological character upon which the identification of the different varieties of "Kombé" seeds has hitherto been based exists in seeds obtained from one and the same pod.

Jamaica Plants.

By T. H. Wardleworth.

The author deals with the medicinal and economical plants of Jamaica.

Indian Drugs.

By W. Mair.

The author submits details concerning the more important unofficial drugs indigenous to British India and in actual use by native and European physicians.

New Books.—John Wiley & Sons, New York City, announce the following new books: "Air, Water and Food from a Sanitary Standpoint," by E. H. Richards and A. G. Woodman; "The Cost of Living as Modified by Sanitary Science," by E. H. Richards; "Sewage and the Bacterial Purification of Sewage," by S. Rideal; "The Oil-Chemists' Handbook," by E. Hopkins. Dodd, Mead & Co. announce that the first edition of J. U. Lloyd's new book, "Stringtown on the Pike," will consist of 10,000 copies, and will appear October 1st.

INTERNATIONAL PHARMACEUTICAL CONGRESS.

The ninth International Pharmaceutical Congress was held, as previously announced (this JOURNAL, 1900, p. v), in Paris, August 3–8, 1900. While it is doubtful if anything of real value was done, it is a good thing to keep up the Congress, as eventually its work must take definite shape. We cannot but agree with the editor of the *Chemist and Druggist* when he says the making of an International Pharmacopœia is one "which chiefly concerns the Pharmacopœia Committees of the various countries. Committees representative of different countries have failed because they have wasted time over details; whereas, it is the principle that waits recognition, and the Pharmacopœia authorities are the people to act upon that." The account which we furnish our readers of the action of this Congress is taken from the issue of August 11, 1900, of that journal.

The meetings of the Congress were held in the École de Pharmacie Supérieure, and were very well attended.

The President, M. Petit, gave simply a cordial welcome to the visitors. The matter of

THE INTERNATIONAL PHARMACOPŒIA

was reported upon by Bourquelot, and a committee was appointed to make a report.

The conclusions arrived at by the committee were as follows:

(1) To prepare a table showing the differences in strength of medicaments bearing the same name in different Pharmacopœias.

(2) To unify this table.

(3) To ask that in future Pharmacopœias the strengths proposed be adopted, and attention called thereto in foot-notes.

(4) The members of the Congress—official and non-official—to do all they can to get the strengths adopted.

(5) To ask the Belgian government to arrange with other governments for a conference in Brussels, and to ask all the members to have their proposals ready to lay before the meeting whenever it may be called.

A. Tschirch submitted the following proposal relative to the International Pharmacopœia:

(1) A conference on this question will not succeed unless the nations most particularly interested (Germany, England, Austria,

Belgium, France, Italy, Russia and Switzerland) are represented by at least two delegates officially recognized by their governments. The other countries should, when possible, send their representatives. The governments of the principal States will thus show from the first that they are favorable to this unification.

(2) The conference will not attain its object unless it prepares a detailed program in advance. The fundamental principles, as also the proposals of the Belgian government, carefully studied and prepared, should be communicated beforehand to the administrators of medical affairs of the countries taking part in the conference. Moreover, the latter should be asked to consider these principles and contribute their opinions.

(3) All academies of medicine and all pharmaceutical societies should be asked to send a representative. It is desirable that these associations on their part discuss and study the scheme.

(4) The question cannot be solved by an improvised meeting of delegates little acquainted with it. It is only a carefully-thought-out scheme, discussed in a conference constituted as suggested, which could attain the end that all the world so earnestly desires.

THE STUDY OF PHARMACY.

Paul Jacob submitted a report on the preliminary education and compulsory examinations therein requisite before beginning the study of pharmacy. His conclusions were that there was a universal tendency in Europe to get the equivalent of the Bachelor of Arts grade, and while a certain importance is attached to the study of Latin, the tendency is to do away with the dead languages.

STANDARDIZATION METHODS.

The committee appointed at the last Congress to consider the subject of unification of assay processes had nothing to report, save that the subject was a difficult one of solution. Anton Altan, of Bucharest, submitted a long monograph on the narcotic extracts and their assay. The preparations dealt with were extracts of aconite, belladonna, henbane, digitalis, colocynth, cannabis indica, opium, ergot and nux vomica. He reviewed the methods of assay suggested by E. Dieterich, Kremel, Dunstan and Short, Kunz, Beckurts, Ranwez, Duyk, and others, as well as the pharmacopœial methods,

amongst the latter the processes of the Swiss and British Pharmacopœias being specially mentioned. Many results obtained by the author were given, and the monograph included a careful study of the volumetric methods of assay, Dieterich's, Beckurt's and Keller's being as far as possible compared. The author also submitted the necessity for uniform methods for estimating moisture, ash and potassium carbonate in the ash. The following are his recommendations:

Extract of Aconite.—The root to be exhausted with a menstruum composed of tartaric acid 1, alcohol 15, and water 30 (all by weight), by maceration (twenty-four hours) and percolation, the exhaustion being continued, if necessary, with a mixture of water 2, and alcohol 1. From 100 parts of aconite the first 80 parts of percolate should be reserved and the rest concentrated to 20. This 100 parts to be mixed well with 100 parts of alcohol. After standing forty-eight hours the clear liquid is decanted. The residue is dissolved in 10 parts of water, and 30 parts of alcohol added. After twenty-four hours the solution is filtered, mixed with the first clear portion, and evaporated to dryness.

Tests.—Twenty centigrammes of this extract is treated with 1 c.c. water, 8 c.c. ether and 5 drops of 10 per cent. solution of sodium hydrate, the ether decanted and evaporated. The residue should give a violet-brown coloration with phosphoric acid. Moisture, 2·49 to 5·10 per cent.; ash, 1·74 to 4·56; K_2CO_3 in ash, 27·6 to 50 per cent.; and the extract should contain 1 per cent. of alkaloids.

Extract of Belladonna.—The method is similar to the foregoing, but the menstruum is equal parts by weight of alcohol and water. Belladonna-root is recommended.

Tests.—The residue from the ether and alkali (ammonia) treatment should give a violet coloration with alcoholic solution of potash (Vitali's reaction), and it is to be distinguished from extract of henbane by the blue fluorescence of the chloroformic residue treated with ammonia (presence of chrysatropic acid). Moisture, 1·5 to 4·6 per cent.; ash, 4·45 to 8 per cent.; K_2CO_3 in ash, 46 to 56 per cent.; alkaloids, 1 per cent.

Extract of Henbane.—Prepared from the leaves with a menstruum consisting of water 30, and alcohol 15.

Tests.—Vitali's reaction: moisture, 1·43 to 5 per cent.; ash, 8·04 to 12·3; K_2CO_3 in ash, 34 to 60·2 per cent.; alkaloids, 0·5 per cent.

Extract of Nux Vomica.—The powdered drug to be freed from fat with ether, then exhausted with alcohol.

Tests.—Presence of brucine and strychnine proved: moisture, 0·4 to 2·8 per cent.; ash, 2·5 to 3·6 per cent.; K_2CO_3 in ash, 15 to 21·5 per cent.; alkaloids, 15 per cent.

Extract of Opium.—Prepared by exhaustion with water.

Tests.—Presence of meconic acid and morphine proved: moisture, 2·2 to 9 per cent.; ash, 5·4 to 7 per cent.; K_2CO_3 in ash, 0·1 to 2·5 per cent. Morphiometric process proposed is Dieterich's, 20 per cent. of morphine being the strength.

Extract of Digitalis.—Made from the leaves, like extract of belladonna.

Tests.—Moisture, 2·5 to 5 per cent.; ash, 8·14 to 9·6 per cent.; K_2CO_3 in ash, 2·5 to 6·2 per cent.; digitoxine, 1 per cent. Assay method given.

Extract of Ergot.—The powdered ergot is to be freed from fat with petroleum ether, and, after drying, it is exhausted by percolation with dilute alcohol. The percolate is acidulated with hydrochloric acid to precipitate sclererythrine, and, after filtration, neutralized with sodium carbonate and evaporated to dryness.

Tests.—Color reactions for cornutine: moisture, 1 to 10·5 per cent.; ash, 3·55 to 6 per cent.; K_2CO_3 in ash, 18·1 to 65 per cent.; cornutine, 0·15 per cent., by Keller's process.

Extract of Colocynth.—Made with alcohol.

Tests.—Color reactions: moisture, 0·9 to 6·5 per cent.; ash, 15 to 26·3 per cent.; K_2CO_3, 36·3 to 60 per cent.

Extract of Cannabis Indica.—Prepared with alcohol. No tests given.

CAPSULING OF LIQUIDS AND SOLIDS.

Lépinois and Michel gave an interesting paper and demonstration of a method of capsuling liquids and solids. They first make gelatin or gluten tubes by, in the case of the gelatin tubes, dipping thin glass tubes, rubbed over with French chalk, into solution of gelatin melted in a water-bath. The solution is made according to the formula of the French Codex. When the gelatin is set the tube is slipped off the mould in the manner described in the *Chem. and Drug.*, winter number, 1900, in the article on gelatin capsules. The tubes are then filled, and having found out what quantity of a powder the

interior of the tube holds, a special pair of pincers is used to cut off the capsules at any desired distance. The pincers can be adjusted very accurately for this work. The resulting capsules are cushion-shaped, but can be rounded by trimming off the corners. M. Lépinois gave a demonstration of his method, and assured us that patients found no difficulty in swallowing the square capsules. The process was fairly quick, but did not seem to present many advantages over the hollow-capsule method used.

EMODINES.

Tschirch presented a paper on the emodines.

He has divided emodines into two classes, the first one containing rheum-emodin, frangula-emodin and cathartic-emodin, which give a deep-red color when treated with sulphuric acid and followed by ammonia; whilst the second class, containing aloes-emodin and senna-emodin, give a brighter red color with the same reagents. Professor Tschirch also distinguishes them by their melting points —the first group melting at 250° C., the second at from 223° to 224° C.

METHOD OF RAPIDLY WEIGHING EXTRACTS.

Brociner described a method for rapidly weighing extracts, in which a sliding weight is used on the beam to give the weight of a capsule, into which a quantity of any extract could then be weighed.

TARTAR EMETICS.

Baudan gave a rather scientific paper on the constitutional formulæ of these compounds.

CULTIVATION OF MEDICINAL PLANTS.

Bavay read a paper on the influence of cultivation on the activity of medicinal plants. He argued that in those plants which contain alkaloids the alkaloidal determination may be made the measure of success in cultivation, and instanced opium, cinchona, tobacco, coca and kola as proof thereof; but other drugs, such as henbane, digitalis, strophanthus, colchicum and aconite, also came into the reckoning. M. Bavay hazarded the suggestion that the failure of Jamaica cinchona to come up to the normal alkaloidal standard of the species grown is proof that proximity to the sea in-

fluences the value of the drug, as well as the altitude and soil. In fact, he regarded atmospheric humidity as an extremely potent influence in alkaloid-production, instancing the great activity of Indian *Datura tatula*, as compared with *D. stramonium*, and how tobaccos vary in nicotine-content according to their geographical source. Opium gave him an interesting example, and he had figures to go upon; thus, at Amiens, in 1860, opium was made from poppies grown there which yielded 22·88 per cent. of morphine. Some produced in Auvergne gave 17·5 per cent. Smyrna opium, he said, yields 10 to 12 per cent., and that of India only 2 to 3 per cent. Is there not here, he queried, evidence that humidity of the air, as well as temperature, has a marked influence on the quality of the product? Then he quoted Flückiger and Hanbury's statement regarding annual and biennial henbanes, and mentioned the superiority of British digitalis over the continental, concluding with references to European, Indian and Japanese aconite, which gave a little too much credit to geographical difference and too little to difference in species.

CINCHONA CULTIVATION.

Three papers on cinchona cultivation were read: Verne dealing with the culture in the British and Dutch Indies. Reimers considered the subject from a general aspect. Reimers and Goris submitted suggestions for a monograph on the subject.

CONIFEROUS RESINS.

A. Tschirch presented a paper on some of the most recent researches in coniferous resins.

MENISPERMACEÆ.

Mahen gave the results of some work on the menisperms.

PELLETIER AND CAVENTOU MONUMENT.

The unveiling of the Pelletier and Caventou monument was, as expected, a most important and inspiring event. Moissan, in delivering the oration for the occasion, traced the career of the two *savants*, stating that Bertrand Pelletier, father of Joseph Pelletier, was a member of the Academy of Sciences and a pharmacist in Paris. Joseph Pelletier became a professor in the School of Phar-

macy at 26 years of age. He was a brilliant teacher, and his teaching exercised the greatest influence on his pupils. At a comparatively early age death took him from his family and from science. The Caventou family originated in Poitou, but the father of the *savant* was an army pharmacist in the Nord, Sambre and Meuse district. When he left the army he settled at St. Omer, near Calais. It was only natural that young Caventou should think of following his father's career. He went to Paris to study. He presented himself for the "internat" examination, and passed in 1815 at the head of all the candidates. In March of that year Napoleon returned from Elba. Caventou enlisted as a military pharmacist, and was sent to Waarden, a small Dutch town, where he remained till after Waterloo. The garrison would not believe the news of Napoleon's defeat until a French officer was sent to bear the news. Then they surrendered the fortress to the allies. Caventou was 20 years old at this time. He returned to Paris and studied at the School of Pharmacy and Faculty of Sciences, passed the "internat" examination, and was appointed pharmacist at St. Antoine Hospital. Here he made Pelletier's acquaintance, and their fruitful collaboration began. Chlorophyll, brucine, veratrine, quinine and other discoveries were the results of their united labors, and, as M. Moissan put it, "in four years the great family of alkaloids was established." M. Moissan explained the difficulties and dangers of administration of Peruvian bark before the discovery of quinine, and said that Pelletier and Caventou might be said to have carried out the idea of Paracelsus to have all medicaments reduced to active principles. He quoted the eulogium of Caventou pronounced at the Academy of Medicine by Dr. Bergerin, "Whatever revelations or deceptions the future reserves to medicine, one fact is absolutely established—the sovereign efficacy of quinine, not only for malarial fevers, but for a long series of pathologic conditions (from the majority of intermittent maladies to typhoid fever and acute rheumatism) of which the mere enumeration would fatigue the most patient audience." M. Moissan continued by sketching the difficulty experienced in getting quinine as a new remedy recognized, and paid a tribute to Dr. Maillot, the military surgeon, who introduced it into Algeria. He recalled the presentation of Pelletier and Caventou's thesis on their discovery to the Academy of Sciences on September 11, 1820, in which they stated that they had isolated cinchonine and quinine from both yel-

low and red cinchona bark, and described their therapeutic properties, which latter information received splendid confirmation from Algeria. In 1827 the Montyon prize was awarded to them, and Caventou filled with distinction the chair of toxicology in the Paris School of Pharmacy. M. Moissan concluded by saying: "We have associated the two *savants* on the same pedestal. We have rendered homage to Bertrand Pelletier and his son Joseph; we render homage to Joseph Caventou and his son Eugène, our dear colleague, whom we have here amongst us this morning."

M. Edmond Lepelletier, Municipal Councillor, in the name of the city, thanked those who had given Paris the handsome monument. The statue-mania had been severely criticised, he said, but their best answer was only to erect statues to glorious and beneficent men like Caventou and Pelletier. The schoolboy, returning from his studies, would ask why these men figured thus in a public place, and he would receive the explanation and look upon the figures with respect and admiration. Now-a-days, when Africa was being divided among the civilized nations, it was well to remember that Pelletier and Caventou, the discoverers of quinine, were the benefactors of the explorers and military men who had opened up the Dark Country to civilization. Statues were raised to generals and conquerors—their fame was but temporary—the only lasting conquests were those of science. He saluted these men, whose memory was henceforth draped in imperishable bronze.

M. de Mazières spoke in the name of the Parisian pharmacists. This, he said, was the first public statue erected to a pharmacist at Paris, or even elsewhere. It was true that Parmentier had his statue at Neuilly, and Planchon at Montpellier, but the one was erected in honor of the introducer of the potato into France, the other was for the services Planchon had rendered to the wine-growers. A few steps away were the statues of Vauquelin and Parmentier, but they were timidly placed in the forecourt of the School of Pharmacy—they had not dared to place them in the public streets. And why this absence of pharmacists' statues? Were they less worthy, less useful than others? By no means. But pharmacists were modest folk. Kept at their homes by their business, mixing little with the outside world, their exaggerated modesty prevented them from being recognized by the public. But is it so difficult to show the public that a pharmacist, instead of being a little retail shopkeeper, is a man of

varied knowledge? Simple facts show how useful he has been in the progress of chemistry and other sciences. Men like Scheele, Priestley, Davy, Baumé, Roliquet, Soubeiran and Pelouze were pharmacists, not to mention others who surround us at the present moment. "Let us," concluded M. de Mazières, "show all this; let us prove it by pointing to the venerated features of those who have preceded us. That is why this statue is erected to-day. We do not wish alone to ornament a public place—we wish to do a work of reparation and justice towards two famous pharmacists, and towards the noble profession they adorned. Pelletier and Caventou's image will rest here for long centuries; it will serve as an example to many generations of students who pass daily on their way to the lessons of their learned professors, and, at the same time, it will teach the crowd the lesson we had sought to teach, that pharmacists have, by their science and unselfishness, merited the title of 'benefactors of humanity.'"

M. Pelisse read an eloquent address prepared in the name of the General Association of French Pharmacists by M. Riethe, who was absent through a family bereavement. He spoke in the name of French pharmacists, saying that in this day of reparation 10,000 hearts in France and abroad, from famous professors to humble apprentices, would beat together in pride and joy at the honor done to the profession. Pelletier and Caventou united all the qualities—science, unselfishness, love of one's neighbor. "To the glory of pharmacy" might be the inscription engraved on the pedestal. Yes; from the humble *officines* of pharmacists this famous remedy had made its way over the entire world. Illustrious masters and humble practitioners of pharmacy joined hands in a common pride and a common hope. To those who were never tempted by vulgar publicity, international pharmacy to-day offered the tribute of its admiration. The lesson of all this was unity—let them profit by this Congress to unite among themselves, whatever their opinions or nation. They had united Pelletier and Caventou in one statue; at its feet let them unite themselves.

M. Guignard, Director of the School of Pharmacy, traced the career of Pelletier and Caventou at the School of Pharmacy. It was extremely unfortunate for the auditors that the rumble of traffic on this busy thoroughfare somewhat covered the voice of the eminent botanist. He alluded to the "two glorious and inseparable

names" of those whose "work, perseverance and devotion were an honor to the profession, to science and to humanity."

It may be explained that it was the erection of a monument to Dr. Maillot at Neuilly which gave the idea of starting the subscription for the Pelletier-Caventou monument. The statue is the work of M. Edouard Lormier, and the pedestal was designed by M. Georges Lisch, architect, who is a grand-nephew of Caventou.

RESULTS OF THE CONGRESS.

Crinon gave a report on the work of the Congress, in which he said:

The analytical methods for estimating the quantities of alkaloids and other active principles in simple drugs and galenicals were left to the International Pharmacopœia Committee to consider. The study of the influence of cultivation on the activity of medicinal plants had not yet advanced enough to take a definite vote on the subject; but it was recommended that pharmacologists take up the subject, and report to future Congresses. They had still to study the nature of the secretions and excretions of parasitic worms and what their influence is on the object they attack. The localization of the active principles in medicinal plants also required the further attention of pharmacologists. As to the unification of the methods of cultivation in bacteriology, it was still impossible to fix a universal plan, but pharmacists were invited to make out suggested lists. An ideal process for interpretation of the results of the analysis of urine has yet to be found. He advised pharmacists to follow Winter's method for analyzing gastric juice. Other urine-analysis questions were dealt with. The Professional Section of the Congress had voted the inspection of pharmacies to be desirable, if conducted by sworn government inspectors approved by societies of pharmacists. They thought the name of a medicament should not be allowed to be monopolized as a trade-mark, and that the limitation of the number of pharmacies is essential to the interests of pharmacists, but no decision as to the best system was come to.

It was considered that Latin is indispensable to pharmacists, and should be exacted from aspirants in every country. It was agreed that pharmacy is both a profession and a trade, but the professional side should not be submerged by the commercial.